

Appendix C: Water and Sewer Capacity Impacts

Prepared by the City of Milpitas

**PROPOSED MILPITAS TRANSIT AREA SPECIFIC
PLAN**

DRAFT WATER AND SEWER IMPACTS

As of April 11, 2006

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TRANSIT AREA DRAFT WATER AND SEWER SPECIFIC PLAN IMPACTS

As of April 11, 2006

EXECUTIVE SUMMARY. This evaluation provides a water and sewer needs assessment based upon preliminary planning densities for the Specific Plan as provided by Leslie Gould of Dyett and Bhatia in an email dated February 22, 2006 (see Attachments 1 and 2). The purpose of the evaluation is to determine the order-of-magnitude of additional water demands and sewage generated due to the proposed Specific Plan, as compared to the 2002 Water Master Plan and August 2004 Sewer Master Plan Update.

Introduction : The Milpitas Transit Area Specific Plan (Specific Plan) is a proposed General Plan amendment that would alter land use designations and allow for higher development densities within the planning area (see attachment 5) under buildout conditions. The City of Milpitas Water and Sewer Master Plans (Master Plans) projected buildout water demand and sewage generation based upon parcel size, General Plan land use designation and corresponding flow factors established by the Master Plans. Therefore, any change in land use designation or development density may result in a net increase in buildout sewage generation and potable water demand.

Findings: Assuming development occurs at the Revised Preferred Plan Reasonable Worst Case Scenario, ***the Specific Plan will result in a 1.01 million gallons per day (mgd) net increase in sewage generation and 0.90 mgd net increase in water demand.***

TRANSIT PLAN PREMISES. Dyett and Bhatia, a City consultant that assisted in the development of Transit Area Concept Plan, provided development densities under two scenarios, the Revised Preferred Plan and the Preferred Alternative Plan. “High” and “Low” range development densities were provided for both scenarios as shown in Attachment 1 and 2. A detailed break out of development densities by land use and planning sub-area are provided in tables 6 and 7. The development densities provided represent the range of gross square foot floor area or number of dwelling units that will be added as a result of this plan. The numbers include only those parcels within the planning area with buildout land use or allowed development densities altered by the proposed Specific Plan. Parcels within the planning area that will remain consistent with the Water and Sewer Master Plans are not included in these numbers. Unaffected parcels located within the planning area are identified in Attachment 5.

The determination of sewage generation and water demands were based upon reasonable flow factors obtained from the City’s 2002 Water Master Plan and 2004 Sewer Master Plan Update. Mixed Use flow factors consist of a proportional blend of contributions from each type of use assuming 60% residential, 35% office and 5% retail. Finally, the Specific Plan includes the following premises:

- **Gross Acreage.** Gross Acreage is used to calculate the actual allowable number of residential units and commercial square footage (based on allowable densities applied to the gross area). Gross Area is defined as the sum of:
 - **Existing Developed Areas:** Area from property line to property line (rather than to the middle of the street as previously defined). Acreage does not include previously dedicated roads, parks, schools, and other ROWs.
 - **Undeveloped Areas:** Area of undeveloped property including any areas that will be dedicated for roads, schools, and other ROWs.
- **Density Bonus.** Residential estimates may include an affordable housing allocation of up to 20%. The Revised Preferred Plan estimates include a 25% density bonus (both residential and non-residential) for parcels within the Transit Density Overlay zone. Maximum allowable densities used in this evaluation include density bonuses.
- **Mixed Use Area.** Mixed use areas consist of a blend of residential and commercial properties. Mixed use parcels are assumed to be developed at 60% residential, 35% Office and 5% Retail.
- **Great Mall/Montague Sub-Area Retail Requirements.** In the Great Mall/Montague sub-area, retail square footage is assumed to equal 20% of total residential square footage. It assumes an average residence size of 1000 square feet.
- **Reasonable Worst Case Scenario (RWCS):** This scenario represents the anticipated buildout densities for planning purposes. RWCS is calculated as the midpoint of the “High” and “Low” range buildout development densities. The scenario represents what may be reasonably expected since development will not occur to the maximum extent. It is further assumed that 90% of “development opportunity” will occur within the 20-year planning horizon. Therefore, the development density under the Reasonable worst case scenario is calculated as follows:

$$RWCS = \{ [(High) + (Low)] / 2 \} * .9$$

EVALUATION DISCUSSION. This evaluation consists of determining the additional sewage generation and water demand above that already identified in the City's 2002 Water and 2004 Sewer Master Plans. The evaluation consists of determining the following:

1. *Master Plan Water Demand and Sewage Generation:* Determine buildout water demand and sewage generation assigned to parcels within the planning area by the existing Master Plans.
2. *Existing Parcels in Planning Area with No Changes.* Identify parcels within the Specific Plan for which land use remains consistent with the Water and Sewer Master Plans. (Attachment 5)
3. *Specific Plan Water Demand and Sewage Generation.* Determine water demand and sewage generation due to the proposed Specific Plan development densities described in Attachments 2 and 3 including parcels identified in Step 2, by multiplying number of units and/or sq. ft. by categorical flow factors identified in the Master Plans.

4. *Increase in Water Demand and Sewage Generation above Master Plans.* Determine the increase in water demand and sewage generation by subtracting the Master Plan quantities (Step 1) from the Specific Plan quantities (Step 3).

1. *Master Plan Water Demand and Sewage Generation.* Using GIS data provided in the Master Plans, we are able to isolate the planning area and sum total weekday and weekend sewage generation as well as total water demand. Master Plan demands under buildout conditions are summarized in Table 1. These flows represents the baseline prior to any changes proposed in the Specific Plan and are used to compare against increases associated with the Specific Plan. **The "baseline flows" are 1.2 mgd for sewage generation, and 1.55 mgd for water demand.**

2. *Existing Parcels in Planning Area with No Changes.* Several Parcels within the Planning Area remain consistent with the Milpitas Water and Sewer Master Plans (See Attachment 5). Such parcels include the Great Mall and surrounding retail parcels, industrial parcels along Lundy, as well as the Crossings at Montague residential development and adjacent retail. The water demand and sewer generation rates assigned to these parcels in the Master Plans were calculated (see table 2) resulting in a total **sewage generation of 0.32 mgd weekend and 0.33 mgd weekday and a total water demand of 0.40 mgd.** This is considered to be the “Base Flow” and “Base Demand” retained within the project area and is included as a component of the Proposed Specific Plan totals.

3. *Proposed Specific Plan Water Demand and Sewage Generation.* Tables 1-S through 8-S provide data used to calculate the sewage generation associated with the Specific Plan under various scenarios. Table 1-S summarizes development densities as provided by Dyett & Bhatia, Table 2-S lists categorical flow factors as identified in the Sewer Master Plan. Tables 3-S through 8-S show the calculations for weekend and weekday sewer flows by land use category under various buildout scenarios based on information provided in tables 1-S and 2-. For example, for the Preferred Alternative Plan Reasonable Worst Case Scenario, the Very High Density Residential flow factor of 2.7 resident per dwelling unit and 90 gallons per capita per day (gpd) average sewage generation (or 243 gpd) from the City 2004 Master Plan was applied to the 1,679 dwelling units (Table 1-S) to result in an estimated sewage generation of 407,997 gallons per day (Table 7-S). Water Demands were calculated in a similar fashion and are shown in Tables 1-W through 5-W.

4. *Increase in Water Demand and Sewage Generation Above Master Plans:* Tables 3, 4 and 5 summarizes total sewage generation and water demands due to the proposed Specific Plan. Table 3 summarizes sewage generation under weekend conditions whereas Table 3 summarizes sewage generation under weekday conditions; Table 3 controls since more sewage is generated during the weekend than during a typical weekday. Table 5 summarizes water demand due to the proposed Specific Plan.

Assuming Development will occur at the Reasonable Worst Case Scenario of the Revised Preferred Plan, the specific plan will generate 2.20 mgd of sewage (Table 3) and a water demand of 2.45 mgd (Table 5). **Under the Revised Preferred Plan Reasonable Worst Case Scenario,**

the net increase over the existing Master Plan projections are 1.01 mgd (2.20 mgd - 1.19 mgd) for sewage generation and 0.90 mgd (2.46 mgd - 1.556 mgd) for water demand at buildout. Under the Preferred Alternative Plan Reasonable Worst Case Scenario the net increase over existing Master Plan projections are .62 mgd for sewage generation and .51 mgd for water.

The range of possible sewage generation increase is between 0.76 mgd and 1.59 mgd under the Revised Preferred Plan scenario and 0.50 to 1.0 mgd under the Preferred Alternative Plan Scenario. The range of possible water demand increase is between 0.72 and 1.50 mgd under the Revised Preferred Plan scenario, and .45 to .91 mgd under the Preferred Alternative Plan scenario.

	Code	2002 WUF (gpd/ksf)	2002 WUF (gpd/acre)	2002 BWF weekday	2002 BWF weekend	FAR		
Gen Commercial	CMRL	120	2400	1000	1000	0.5	110.1928	45.91368
Public/Semi Public	CVC		1000	500	500	0.5	45.91368	22.95684
Manufacturing	IND	100	2000	1000	600	0.5	91.82736	45.91368
Industrial Park	INDP	50	1250	1000	400	0.4	71.74013	57.3921
Parks/Recreation	PRKL		1300	0	0			
Professional Admin	PAO	160	3200	1000	1000	0.5	146.9238	45.91368
Retail Sub Center	RSC	150	4290	1000	1000	0.35	281.3853	65.59097
MXD			10890	1500	1500	0.75	333.3333	45.91368
MXD TOD			14520	2000	2000	1	333.3333	45.91368
CMRL-OO			7200	3000	3000	1.5	110.1928	45.91368

gpd/ksf calculated by (gpd/acre)*(1acre/43560 sq ft)*(1/FAR)

	Code	2002 WUF (gpd/ksf)	2002 WUF (gpd/acre)	2002 BWF weekday	2002 BWF weekend	FAR	Ratio of waste water to potable water
Gen Commercial			110	46	46		2.4
Public/Semi Public			46	23	23		2
Manufacturing			92	46	28		2
Industrial Park			57	46	18		1.25
Parks/Recreation			60				
Professional Admin			147	46	46		3.2
Retail Sub Center			197	46	46		4.29
MXD			500	69	69		
MXD TOD			667	92	92		
CMRL-OO			331	138	138		

gpd/hsf calculated by (gpd/acre)*(FAR/10)

Gen Commercial	120	50	50
Public/Semi Public	50	25	25
Manufacturing	100	50	30
Industrial Park	50	40	16
Parks/Recreation	0	0	0
Professional Admin	160	50	50
Retail Sub Center	150.15	35	35
	0	0	0
MXD	816.75	112.5	112.5
MXD TOD	1452	200	200
CMRL-OO	1080	450	450

TOD SEWER IMPACT SUMMARY

Revised Draft Preferred Plan*

Table 1 - Water and Sewer Master Plan Buildout (a) Water Demand and Sewage Flows (gpd)

Land Use	Water	Sewer- Weekend	Sewer - Weekday	Remarks
MFVH-TOD	966,071	966,072	912,401	
HOTEL	30,510	29,700	29,700	
PAO	13,792	4,310	4,310	Professional/Administrative Offices
SCHL	0	0	0	School, no water demand nor sewer flow were assigned to this parcel in the area.
LWU	91,051	67,338	67,338	Large Water User/Discharger
RSC	16,903	3,940	3,940	Retail Sub-center
CMRL	22,944	9,560	9,560	General Commercial
IND-TOD	229,939	47,268	78,780	Manufacturing/Warehousing TOD
IND	184,622	59,004	98,340	Industrial Manufacturing/Warehousing
Total	1,555,832	1,187,192	1,204,369	

(a) 2018 Buildout using models;
planning area is about 440 gross acres (per V. Woo using MRSid, 3/1/05)

**Table 2 - Baseline Water Demand and Sewage Flow Retained within Project Area
(Parcels with land use consistent with Master Plans)**

Land Use	Water	Sewer- Weekend	Sewer - Weekday	Remarks
MFVH-TOD	218,117	205,999	205,999	
HOTEL	30,510	29,700	29,700	
PAO	9,600	3,000	3,000	Professional/Administrative Offices
SCHL	0	0	0	School, no water demand nor sewer flow
LWU	91,051	67,338	67,338	Large Water User/Discharger
RSC	11,070	2,000	2,000	Retail Sub-center
CMRL	26,792	11,740	11,740	General Commercial
IND-TOD	9,488	3,558	5,930	Manufacturing/Warehousing TOD
IND	5,540	1,662	2,770	Industrial Manufacturing/Warehousing
Subtotal	402,168	324,997	328,477	

Table 3 - WeekendChange in Sewage Flows (mgd)

		Revised Preferred Plan	Preferred Alternative Plan	Comments
TOD Demand	high	2.78	2.19	See Table 3-S and 6-S
	low	2.03	1.75	See Table 4-S and 7-S
	rwcs**	2.20	1.81	See Table 5-S and 8-S
2004 Master Plan		1.19	1.19	See Table 1, Weekend
Net Increase	high	1.59	1.00	
	low	0.84	0.56	
	rwcs**	1.01	0.62	

* Development densities provided by Dyett and Bhatia March 3, 2006

** RWCS = Reasonable Worst Case Scenario. Assumes development will occur at 90% of high low midpoint.

4/20/2006

TOD SEWER IMPACT SUMMARY

Revised Draft Preferred Plan*

Table 4 - Weekday Change in Sewage Flows (mgd)

		Revised Preferred Plan	Preferred Alternative Plan	Comments
TOD Demand	high	2.68	2.12	See Table 3-S and 6-S
	low	1.96	1.70	See Table 4-S and 7-S
	rwcs**	2.12	1.75	See Table 5-S and 8-S
2004 Master Plan		1.20	1.20	See Table 1, Weekday
Net Increase	high	1.48	0.92	
	low	0.76	0.50	
	rwcs**	0.92	0.55	

Table 5 -Change in Water Demand (mgd)

		Revised Preferred Plan	Preferred Alternative Plan	Comments
TOD	high	3.06	2.47	See Table 3-W
	low	2.28	2.01	See Table 4-W
	rwcs**	2.46	2.07	See Table 5-W
2004 Master Plan		1.56	1.56	See Table 1, Weekend
Net Increase	high	1.50	0.91	
	low	0.72	0.45	
	rwcs**	0.90	0.51	

* Development densities provided by Dyett and Bhatia March 3, 2006

** RWCS = Reasonable Worst Case Scenario. Assumes development will occur at 90% of high low midpoint.

Table 5
Milpitas Transit Area Specific Plan
Proposed Development Densities - March 2006
Preferred Alternative Plan

			Preferred Alternative Plan Gross Sq. Ft. High Estimate			3/1/2006		
			Bart Station Area	Great Mall/Montague	Great Mall/Retail	Montague Trade Zone	Piper/Montague	TOTAL
Very High Density Transit Oriented		Low	504	0	0	693	431	1,628
		High	651	0	0	895	557	2,103
		rwcs	520	0	0	715	445	1,679
Very High Density Transit Oriented with Transit Density Overlay		Low	0	0	0	0	0	0
		High	0	0	0	0	0	0
		rwcs	0	0	0	0	0	0
High Density Transit Oriented Residential		Low	0	0	1,218	590	425	2,233
		High	0	0	1,572	761	548	2,881
		rwcs	0	0	1,256	608	438	2,301
Medium Density Residential		low	0	0	490	0	213	703
		High	0	0	700	0	304	1,004
		rwcs	0	0	536	0	233	768
BLVD Very High Density Mixed Use Non - Residential	Office	Low	119,715	0	185,681	292,459	80,130	677,985
		High	179,573	0	278,521	438,688	120,195	1,016,977
		rwcs	134,680	0	208,891	329,016	90,146	762,733
	Retail	Low	5,986	0	9,284	14,623	4,006	33,899
		High	5,986	0	9,284	14,623	4,006	33,899
		rwcs	5,387	0	8,356	13,161	3,605	30,509
BLVD Very High Density Mixed Use Non - Residential with Transit Density Overlay	Office	Low	0	0	0	0	0	0
		High	0	0	0	0	0	0
		rwcs	0	0	0	0	0	0
	Retail	Low	0	0	0	0	0	0
		high	0	0	0	0	0	0
		rwcs	0	0	0	0	0	0
BLVD Very High Density Mixed Use Residential		Low	146	0	227	357	98	828
		High	188	0	292	460	126	1,066
		rwcs	150	0	234	368	101	852
BLVD Very High Density Mixed Use Residential with Transit Density Overlay		Low	0	0	0	0	0	0
		High	0	0	0	0	0	0
		rwcs	0	0	0	0	0	0
Hotel		Low			175,000			175,000
		High	0	0	215,000	0	0	215,000
		rwcs	0	0	175,500	0	0	175,500
High TOR Retail Requirement		Low	0	0	341,672	0	0	341,672
		High	0	0	454,416	0	0	454,416
		rwcs	0	0	358,240	0	0	358,240
Required Local Serving Retail		Low	5,000	0	0	5,000	5,000	15,000
		High	10,000	0	0	10,000	10,000	30,000
		rwcs	6,750	0	0	6,750	6,750	20,250
Retail		Low	0	38,954	0	29,709	0	68,663
		High	0	38,954	0	29,709	0	68,663
		rwcs	0	35,059	0	26,738	0	61,797

Table 5
Milpitas Transit Area Specific Plan
Proposed Development Densities - March 2006
Preferred Alternative Plan

			Preferred Alternative Plan Gross Sq. Ft. High Estimate			3/1/2006		
			Bart Station Area	Great Mall/Montague	Great Mall/Retail	Montague Trade Zone	Piper/Montague	TOTAL
Light Industrial		Low						0
		High						0
		rwcs	0	0	0	0	0	0
Schools		Low						731
		High						731
		rwcs	0	0	0	0	0	731
Total Res. Units		Low	650	0	1,935	1,640	1,167	5,392
		High	839	0	2,564	2,116	1,535	7,054
		rwcs	670	0	2,025	1,690	1,216	5,601
Total Non Res sf		Low	130,701	38,954	711,637	341,791	89,136	1,312,219
		High	195,559	38,954	957,221	493,020	134,201	1,818,955
		rwcs	146,817	35,059	750,986	375,665	100,502	1,409,028
Parks/Plazas			114,563	596,336		359,806	182,516	1,253,221
Landscaped areas			266,587	491,357		193,842	269,636	1,221,422

Table 6
Milpitas Transit Area Specific Plan
Proposed Development Densities - March 2006
Revised Preferred Plan

			Preferred Alternative Plan Gross Sq. Ft. High Estimate			3/1/2006		
			Bart Station Area	Great Mall/Montague	Great Mall/Retail	Montague Trade Zone	Piper/Montague	TOTAL
Very High Density Transit Oriented		Low	416	0	0	355	571	1,342
		High	609	0	0	520	835	1,964
		rwcs	461	0	0	394	633	1,488
Very High Density Transit Oriented with Transit Density Overlay		Low	251	0	0	563	0	814
		High	458	0	0	1,028	0	1,486
		rwcs	319	0	0	716	0	1,035
High Density Transit Oriented Residential		Low	0	0	1,941	590	739	3,270
		High	0	0	2,506	761	953	4,220
		rwcs	0	0	2,001	608	761	3,371
Medium Density Residential		low	0	0	0	0	0	0
		High	0	0	0	0	0	0
		rwcs	0	0	0	0	0	0
BLVD Very High Density Mixed Use Non Residential	Office	Low	0	0	185,681	192,391	0	378,072
		High	0	0	278,521	288,586	0	567,107
		rwcs	0	0	208,891	216,440	0	425,331
	Retail	Low	0	0	9,284	9,620	0	18,904
		High	0	0	9,284	9,620	0	18,904
		rwcs	0	0	8,356	8,658	0	17,014
BLVD Very High Density Mixed Use Non Residential with Transit Density Overlay	Office	Low	119,715	0	0	100,068	80,130	299,913
		High	224,466	0	0	187,628	150,243	562,337
		rwcs	154,881	0	0	129,463	103,668	388,013
	Retail	Low	5,986	0	0	5,003	4,006	14,995
		high	7,482	0	0	6,254	5,008	18,744
		rwcs	6,061	0	0	5,066	4,056	15,183
BLVD Very High Density Mixed Use Residential		Low	0	0	300	310	0	610
		High	0	0	438	455	0	893
		rwcs	0	0	332	344	0	676
BLVD Very High Density Mixed Use Residential with Transit Density Overlay		Low	193	0	0	161	129	483
		High	353	0	0	295	237	885
		rwcs	246	0	0	205	165	616
Hotel		Low	0	0	175,000	0	0	175,000
		High	0	0	215,000	0	0	215,000
		rwcs	0	0	175,500	0	0	175,500
High TOR Retail Requirement		Low	0	0	388,340	0	0	388,340
		High	0	0	501,083	0	0	501,083
		rwcs	0	0	400,240	0	0	400,240
Required Local Serving Retail		Low	5,000	0	0	5,000	5,000	15,000
		High	10,000	0	0	10,000	10,000	30,000
		rwcs	6,750	0	0	6,750	6,750	20,250
Retail		Low	0	38,954	0	29,709	0	68,663
		High	0	38,954	0	29,709	0	68,663
		rwcs	0	35,059	0	26,738	0	61,797

Table 6
Milpitas Transit Area Specific Plan
Proposed Development Densities - March 2006
Revised Preferred Plan

			Preferred Alternative Plan Gross Sq. Ft. High Estimate			3/1/2006		
			Bart Station Area	Great Mall/Montague	Great Mall/Retail	Montague Trade Zone	Piper/Montague	TOTAL
Light Industrial		Low						0
		High						0
		rwcs	0	0	0	0	0	0
Schools		Low						879
		High						879
		rwcs	0	0	0	0	0	879
Total Res. Units		Low	860	0	2,241	1,979	1,439	6,519
		High	1,420	0	2,944	3,059	2,025	9,448
		rwcs	1,026	0	2,333	2,267	1,559	7,185
Total Non Res sf		Low	130,701	38,954	758,305	341,791	89,136	1,343,887
		High	241,948	38,954	1,003,888	531,797	165,251	1,981,838
		rwcs	167,692	35,059	792,987	393,115	114,474	1,496,576
Parks/Plazas			114,563	596,336		359,806	182,516	1,253,221
Landscaped areas			266,587	491,357		193,842	269,636	1,221,422

**Table 2-S
Sewer Flow Factors**

Proposed Land Use	Weekend Flow Factor	Weekday Flow Factor	Comments
Residential	gpd/du		
VHD Transit Oriented Res	243	230	Assumes 2.7 residents per dwelling unit and 90 gallons/capita/day weekend (85 gallons/capita/day weekday) per page 3-9 of the 2004 Sewer Master Plan Update
VHD Transit Oriented Res w/Bonus	243	230	
High Density Transit Oriented	243	230	
Medium Density Transit Oriented	243	230	
Bldv High Density Mixed Use Residential	243	230	
Non-Residential	gpd/ksf		
Bldv High Density Mixed Use Retail	46	46	Based upon Mixed Use -TOD BWF factor of 2000 gpd/acre per page 3-9 of the 2004 Sewer Master Plan update. Converted to gpd/ksf by $(2000 \text{ gpd/acre}) * (\text{acre}/43560 \text{ sq ft}) * 1/(\text{FAR})$ where $\text{FAR} = 1.0$
Bldv High Density Mixed Use Office	46	46	Based upon Mixed Use -TOD BWF factor of 2000 gpd/acre per page 3-9 of the 2004 Sewer Master Plan update. Converted to gpd/ksf by $(2000 \text{ gpd/acre}) * (\text{acre}/43560 \text{ sq ft}) * 1/(\text{FAR})$ where $\text{FAR} = 1.0$
Retail	46	46	Based upon CMRL-TOD BWF factor of 3000 gpd/acre per page 3-9 of the 2004 Sewer Master Plan update. Converted to gpd/ksf by $(3000 \text{ gpd/acre}) * (\text{acre}/43560 \text{ sq ft}) * 1/(\text{FAR})$ where $\text{FAR} = 1.5$
Light Industry	23	57	Based upon INDP BWF factors of 1000 gpd/acre (weekday) and 400 gpd/acre (weekend) per page 3 of the 2004 Sewer Master Plan Update. Weekday BWF = 1000 gpd/acre converted to gpd/ksf by $(1000 \text{ gpd/acre}) * (\text{acre}/43560 \text{ sq ft}) * 1/(\text{FAR})$ where $\text{FAR} = .4$
Parks/Plazas	0	0	Assumes minimal sewage generation
Landscape Areas	0	0	Assumes minimal sewage generation
Schools	gpd/person		
Schools	10	10	per page 3-3 of the 2004 Sewer Master Plan Update
Hotel	gpd/room		
Hotel	160	200	100 gpd per person per page 3-3 of 2004 Sewer Master Plan. Assumes 2 persons per room as suggested by RMC, 100% occupancy weekday and 80% occupancy weekend.

Table 3-S
Preferred Alternative Plan High Estimates (gallons/day)

Proposed Land Use		Weekend (gpd)	Weekday (gpd)	Comments
Very High Density Transit Oriented Residential		511,029	483,690	Assumes 40 du / acre
Very High Density Transit Oriented with Transit Density Overlay		0	0	Assumes 40 du / acre
High Density Transit Oriented		700,083	662,630	Assumes 40 du / acre
Medium Density Residential		243,972	230,920	Assumes 30 du / acre
BLVD Very High Density Mixed Use Residential	VHD	259,038	245,180	Assumes 40 du / acre and 60% residential use in mixed use areas
	VHD w/ Bonus	0	0	
BLVD VHD Mixed Use Retail	Retail	1,556	1,556	Assumes 5% retail in mixed use area. FAR =.35
	Retail w/ Bonus	0	0	
BLVD VHD Mixed Use Office	Office	46,693	46,693	Assumes 35% Office use in mixed use area. FAR = 1.5
	Office w/ Bonus	0	0	Assumes 35% Office use in mixed use area. FAR of 1.5
Retail		25,394	25,394	Assumes 20 sq. ft. retail for every 100 sq. ft. of residential development in Great Mall/Montague area. All other areas assume FAR of .35
Light Industrial		0	0	
Parks/Plazas		0	0	Assumes minimal sewage generation
Landscape Areas		0	0	Assumes minimal sewage generation
Hotel		68,800	86,000	Assumes 430 Hotel Rooms
Schools		7,310	7,310	Assumes 731 new students
Base Flows		324,997	328,477	
Total		2,188,872	2,117,850	

* Estimates are results of multiplying Table 1-S and Table 2-S,

Table 4-S
Preferred Alternative Plan Low Estimates (gallons/day)

Proposed Land Use		Weekend (gpd)	Weekday (gpd)	Comments
#VALUE!		395,604	374,440	Assumes 31 du / acre
Very High Density Transit Oriented with Transit Density Overlay		0	0	Assumes 31 du / acre
High Density Transit Oriented (du)		542,619	513,590	Assumes 31 du / acre
Medium Density Residential		170,829	161,690	Assumes 21 units per acre
BLVD Very High Density Mixed Use Residential	VHD	201,204	190,440	Assumes 31 du / acre and 60% Residential use in mixed use areas
	VHD w/ Bonus	0	0	Assumes 31 du / per acre and 60% Residential use in mixed use areas
BLVD VHD Mixed Use Retail	Retail	1,556	1,556	Assumes 5% retail in mixed use area. FAR = .35
	Retail w/ Bonus	0	0	Assumes 5% retail in mixed use area. FAR = .35
BLVD VHD Mixed Use Office	Office	31,129	31,129	Assumes 35% Office use in mixed use area. FAR = 1.0
	Office w/ Bonus	0	0	Assumes 35% Office use in mixed use area. FAR = 1.0
Retail		19,529	19,529	Assumes 20 sq. ft. retail for every 100 sq. ft. of residential development in Great Mall/Montague Area. All other areas assume FAR of .35
Light Industrial		0	0	
Parks/Plazas		0	0	Assumes minimal sewage generation
Landscape Areas		0	0	Assumes minimal sewage generation
Hotel		56,000	70,000	Assumes 350 hotel rooms
Schools		7,310	7,310	Assumes 731 new students
Base Flows		324,997	328,477	
Total		1,750,777	1,698,161	

* Estimates are results of multiplying Table 1-S and Table 2-S

Table 6-S
Revised Preferred Plan High Estimates (gallons/day)

Proposed Land Use		Weekend (gpd)	Weekday (gpd)	Comments
Very High Density Transit Oriented Residential		477,252	451,720	Assumes 60 units / acre
Very High Density Transit Oriented with Transit Density Overlay		361,098	341,780	Assumes 75 units / acre
High Density Transit Oriented (du)		1,025,460	970,600	Assumes 40 Units / acre
Medium Density Residential		0	0	Assumes 30 units / acre
BLVD Very High Density Mixed Use Residential	VHD	216,999	205,390	Assumes 60 units per acre and 60% residential use in mixed use areas
	VHD w/ Bonus	215,055	203,550	Assumes 60% residential use in mixed use areas and 75 units/acre
BLVD VHD Mixed Use Retail	Retail	868	868	Assumes 5% retail in mixed use area. FAR =.35
	Retail w/ Bonus	861	861	Assumes 5% retail in mixed use area. FAR = .44
BLVD VHD Mixed Use Office	Office	26,038	26,038	Assumes 35% Office use in mixed use area. FAR = 1.5
	Office w/ Bonus	25,819	25,819	Assumes 35% Office use in mixed use area. FAR of 1.88
Retail		27,537	27,537	Assumes 20 sq. ft. retail for every 100 sq. ft. of residential development in Great Mall/Montague area. All other areas assumes FAR = .35
Light Industrial		0	0	
Parks/Plazas		0	0	Assumes minimal sewage generation
Landscape Areas		0	0	Assumes minimal sewage generation
Hotel		68,800	86,000	Assumes 430 hotel rooms
Schools		8,790	8,790	Assumes 879 new students
Base Flows		324,997	328,477	
Total		2,779,573	2,677,429	

* Estimates are results of multiplying Table 1-S and Table 2-S

Table 7-S
Revised Preferred Plan Low Estimates (gallons/day)

Proposed Land Use		Weekend (gpd)	Weekday (gpd)	Comments
Very High Density Transit Oriented Residential		326,106	308,660	Assumes 41 du / acre
Very High Density Transit Oriented with Transit Density Overlay		197,802	187,220	Assumes 41 du / acre
High Density Transit Oriented (du)		794,610	752,100	Assumes 31 du / acre
Medium Density Residential		0	0	Assumes 21 du / acre
BLVD Very High Density Mixed Use Residential	VHD	148,230	140,300	Assumes 41 du / acre and 60% Residential use in mixed use areas
	VHD w/ Bonus	117,369	111,090	Assumes 41 du / acre and 60% Residential use in mixed use areas
BLVD VHD Mixed Use Retail	Retail	868	868	Assumes 5% retail in mixed use area. FAR = .35
	Retail w/ Bonus	688	688	Assumes 5% retail in mixed use area. FAR = .35
BLVD VHD Mixed Use Office	Office	17,359	17,359	Assumes 35% Office use in mixed use area. FAR = 1.0
	Office w/ Bonus	13,770	13,770	Assumes 35% Office use in mixed use area. FAR = 1.0
Retail		21,671	21,671	Assumes 20 sq. ft. retail for every 100 sq. ft. of residential development in Great Mall/Montague Area. All other areas assume FAR of .35
Light Industrial		0	0	
Parks/Plazas		0	0	Assumes minimal sewage generation
Landscape Areas		0	0	Assumes minimal sewage generation
Hotel		56,000	70,000	Assumes 350 hotel rooms
Schools		8,790	8,790	Assumes 879 new students
Base Flows		324,997	328,477	
Total		2,028,261	1,960,994	

* Estimates are results of multiplying Table 1-S and Table 2-S

Table 8-S
Revised Preferred Plan Reasonable Worst Case Scenario (RWCS) (gallons/day)

Proposed Land Use		Weekend (gpd)	Weekday (gpd)
Very High Density Transit Oriented Residential		361,511	342,171
Very High Density Transit Oriented with Transit Density Overlay		251,505	238,050
High Density Transit Oriented		819,032	775,215
Medium Density Residential		0	0
BLVD Very High Density Mixed Use Residential	VHD	164,353	155,561
	VHD w/ Bonus	149,591	141,588
BLVD VHD Mixed Use Non-Res (sq. ft.)	Retail	781	781
	Retail w/ Bonus	697	697
	Office	19,528	19,528
	Office w/ Bonus	17,815	17,815
Retail		22,144	22,144
Light Industrial		0	0
Parks/Plazas		0	0
Landscape Areas		0	0
Hotel		56,160	70,200
Schools		8,790	8,790
Base Flows		324,997	328,477
Total		2,196,904	2,121,017

* Assumes development will occur at 90% of high-low midpoint.

Table 1-W
Base Data Assumptions ^{(a) (b)}

Proposed Land Use		Density Option	Preferred Alternative Plan	Revised Preferred Plan	Comments
Residential (# of Dwelling Units)					
Very High Density Transit Oriented Residential		low	1,628	1,342	Assumes 31-60 du / acre
		high	2,103	1,964	
		rwcs	1,679	1,488	
Very High Density Transit Oriented with Transit Density Overlay		Low	0	814	Assumes 31-75 du / acre.
		High	0	1,486	
		rwcs	0	1,035	
High Density Transit Oriented		low	2,233	3,270	Assumes 31-40 du / acre
		high	2,881	4,220	
		rwcs	2,301	3,371	
Medium Density Residential		low	703	0	Assumes 21-30 du / acre
		high	1,004	0	
		rwcs	768	0	
BLVD Very High Density Mixed Use Residential	VHD	low	828	610	Assumes density of 31-60 du / acre and 60% residential development in mixed use areas
		high	1,066	893	
		rwcs	852	676	
	VHD w/ Density Bonus	low	0	483	Assumes 31-75 du/acre and 60% residential use in mxd use areas
		high	0	885	
		rwcs	0	616	
Non-Residential (Square Feet)					
BLVD VHD Mixed Use - Office	Office	low	677,985	378,072	Assumes 35% office use in mixed use areas. FAR = 1.0 to 1.5.
		high	1,016,977	567,107	
		rwcs	762,733	425,331	
	Office w/ Density Bonus	low	0	299,913	Assumes 35% office use in mixed use areas. FAR = 1.0 - 1.88.
		high	0	562,337	
		rwcs	0	388,013	
BLVD VHD Mixed Use - Retail	Retail	low	33,899	18,904	Assumes 5% retail use in mixed use areas. FAR = .35.
		high	33,899	18,904	
		rwcs	30,509	17,014	
	Retail w/ Density Bonus	low	0	14,995	Assumes 5% retail use in mixed use areas. FAR = .35 to .44
		high	0	18,744	
		rwcs	0	15,183	
Retail		low	68,663	68,663	
		high	68,663	68,663	
		rwcs	61,797	61,797	
Light Industrial		low	0	0	
		high	0	0	
		rwcs	0	0	
Parks/Plazas			1,253,221	1,253,221	
Landscape Areas			1,221,422	1,221,422	
Hotel (# of Rooms)					
Hotel		low	350	350	Assume 1 hotel unit per 500 square feet
		high	430	430	
		rwcs	351	351	
Schools (# of new students)					
Schools		rwcs	731	879	
Base Demand (gpd)					
Base Demand			402,168	402,168	

^(b) Residential estimates equal number of dwelling units, non residential estimates equal gross square feet floor area.

**Table 2-W
Water Flow Factors
(gpd/acre or gallons/dwelling unit)**

Proposed Land Use	Flow Factor	Comments
Residential	(gpd/du)	
VHD Transit Oriented Res	243	Per page 3-7 of 2002 water master plan 14580 gpd/acre assumes 60 units per acre
VHD Transit Oriented Res w/ Bonus	243	
High Density Transit Oriented	243	Based upon MFV WUF of 9720 gpd/acre per page 3-7 of the 2002 Water Master Plan. Assumes 40 units per acre
Medium Density Transit Oriented	243	
High Density Transit Oriented Residential (gallons/dwelling unit)	243	
Blvd High Density Mixed Use and Blvd High Density Mixed Use with Transit Density Overlay Residential	243	Per page 3-7 of 2002 water master plan 14580 gpd/acre assumes 60 units per acre
Non-Residential	(gpd/ksf)	
Retail Commercial	120	Applied CMRL WUF of 120 gpd/ksf.(a)
Blvd High Density Mixed Use Office and Blvd High Density Mixed Use Office with Transit Density Overlay	120	Applied CMRL WUF of 120 gpd/ksf.(a)
Light Industry	50	per page 3-7 of 2002 Water Master Plan
Parks & Landscape Areas	65	per page 3-7 of 2002 Water Master Plan. Converted to gpd/ksf by multiplying (gpd/acre) * (FAR/10)
Hotel	gpd/room	
Hotel	200	Assumes 100 gpd per person, two persons per unit
Schools	gpd/student	
Schools	10	

(a) The CMRL WUF serves as baseline for calculating the non-residential component of Future Land Use Categories listed in table 3-1 page 3-7 of the 2002 Water Master Plan. For example the CMRL_OO factor of 7,200 gpd is calculated by GMRL WUF * (CMRL-OO FAR/CMRL FAR) or 2400 gpd/acre * (1.5/.5)

Table 3-W
Flow Projections High Estimates (gallons/day)

Proposed Land Use		Preferred Alt Plan (gpd)	Revised Preferred Plan (gpd)	Comments
Very High Density Transit Oriented Residential		511,029	477,252	Preferred Alt. Plan assumes 40 du/acre. Revised Preferred Plan assumes 60 du/acre
Very High Density Transit Oriented with Transit Density Overlay		0	361,098	Preferred Alt. Plan assumes 40 du/acre. Revised Preferred Plan assumes 75 du/acre
High Density Transit Oriented (b)		700,083	1,025,460	Assumes 40 du/acre
Med Density Residential		243,972	0	Assumes 30 du/acre
BLVD Very High Density Mixed Use Residential	VHD	259,038	216,999	Preferred Alt. Plan assumes 40 du/acre. Revised Preferred Plan assumes 60 du/acre. Assumes 60% residential development in mixed use area
	VHD w/ Bonus	0	215,055	Preferred Alt. Plan assumes 40 du/acre. Revised Preferred Plan assumes 75 du/acre. Assumes 60% residential development in mixed use area
BLVD VHD Mixed Use Office	Office	122,037	68,053	Assumes 35% Office in Mixed Use area. FAR = 1.5
	Office with Bonus	0	67,480	Assumes 35% Office in Mixed Use area. FAR = 1.88
BLVD VHD Mixed Use Retail	Retail	4,068	2,268	Assumes 5% Retail in Mixed Use area. FAR = .35
	Retail w/ Bonus	0	2,249	Assumes 5% Retail in Mixed Use area. FAR = .44
Retail		8,240	8,240	Assumes 20 sq. ft. retail for every 100 sq. ft. of residential development in Great Mall/Montague Area. Assumes FAR = .35 for dedicated retail parcels.
Hotel		86,000	86,000	Assumes 430 hotel units
Light Industrial		0	0	
Schools		7,310	8,790	Assumes 731 new students under Preferred Alt. Plan and 879 Students under the Revised Preferred Plan
Parks/Plazas		62,661	62,661	
Landscape Areas		61,071	61,071	
Base Flows		402,168	402,168	
Total		2,467,677	3,064,845	

Estimates are results of multiplying Table 1-C and Table 2-C, and were converted to acres using 10000 sq. ft. = 1 acre

Table 4-W
Flow Projections Low Estimates (gallons/day)

Proposed Land Use		Preferred Alt Plan (gpd)	Revised Preferred Plan (gpd)	Comments
Very High Density Transit Oriented Residential		395,604	326,106	Revised Preferred Plan assumes 31 du / acre, Preferred Alt Plan assumes 41 du / acre
Very High Density Transit Oriented with Transit Density Overlay		0	197,802	Revised Preferred Plan assumes 31 du / acre. Preferred Alt Plan assumes 41 du / acre.
High Density Transit Oriented (b)		542,619	794,610	Assumes 31 du / acre
Med Density Residential		170,829	0	Assumes 21 du / acre
BLVD Very High Density Mixed Use Residential	VHD	201,204	148,230	Revised Preferred Plan assumes 31 du / acre. Preferred Alt Plan assumes 41 du / acre. Assumes 60% Residential in mixed use areas
	VHD w/ Bonus	0	117,369	
BLVD VHD Mixed Use Office	Office	81,358	45,369	Assumes 35% Office in Mixed Use area. FAR = 1.0
	Office with Bonus	0	35,990	Assumes 35% Office in Mixed Use area. FAR = 1.0
BLVD VHD Mixed Use Retail	Retail	4,068	2,268	Assumes 5% Retail in Mixed Use area. FAR = .35
	Retail w/ Bonus	0	1,799	Assumes 5% Retail in Mixed Use area. FAR = .35
Retail		8,240	8,240	Assumes 20 sq. ft. retail for every 100 sq. ft. of residential development in Great Mall/Montague Area. Assumes FAR = .35 for designated as Retail.
Light Industrial		0	0	
Parks/Plazas		62,661	62,661	
Landscape Areas		61,071	61,071	
Hotel		70,000	70,000	Assumes 430 hotel units
Schools		7,310	8,790	Assumes 731 new students under Preferred Alt. Plan and 879 Students under the Revised Preferred Plan
Base Flows		402,168	402,168	
Total		2,007,132	2,282,473	

* Estimates are results of multiplying Table 1-S and Table 2-S,

Table 5-W
Flow Projections Reasonable Worst Case Scenario* (RWCS) (gallons/day)

Proposed Land Use		Preferred Alt Plan (gpd)	Revised Preferred Plan (gpd)
Very High Density Transit Oriented Residential		407,997	361,584
Very High Density Transit Oriented with Transit Density Overlay		0	251,505
High Density Transit Oriented (b)		559,143	819,153
Med Density Residential		186,624	0
BLVD Very High Density Mixed Use Residential	VHD	207,036	164,268
	VHD w/ Bonus	0	149,688
BLVD VHD Mixed Use Office	Office	91,528	51,040
	Office with Bonus	0	46,562
BLVD VHD Mixed Use Retail	Retail	3,661	2,042
	Retail w/ Bonus	0	1,822
Retail		7,416	7,416
Hotel		70,200	70,200
Light Industrial		0	0
Schools		7,310	8,790
Parks/Plazas		62,661	62,661
Landscape Areas		61,071	61,071
Base Flows		402,168	402,168
Total		2,066,815	2,459,969

* Assumes development will occur at 90% of high-low midpoint.